

REMARKS**I. General**

Claims 1-35 were pending in the present application, and all of such claims are rejected in the current Office Action (mailed March 19, 2004). The outstanding issues raised in the current Office Action are:

- Claims 1-9, 11-17, and 19-35 are rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,163,319 issued to Peercy et al. (hereinafter "*Peercy*");
- Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Peercy* in view of U.S. Patent No. 6,697,062 issued to Cabral et al. (hereinafter "*Cabral*"); and
- Claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Peercy* in view of U.S. Patent No. 5,537,494 issued to Toh (hereinafter "*Toh*").

In response, Applicant respectfully traverses the outstanding claim rejections, and requests reconsideration and withdrawal thereof in light of the amendments and remarks presented herein.

II. Amendments

Claims 27 and 32 are amended and new claims 36-51 are added herein. No new matter is added by these amendments or claim additions.

More particularly, claim 27 is amended herein to clarify that the recited texture map data structure includes a function that evaluates the recited variables. Similarly, claim 32 is amended to clarify that the recited texture map data structure includes a function that evaluates the recited variables.

III. Rejections under 35 U.S.C. § 102(a) over *Peercy*

Claims 1-9, 11-17, and 19-35 are rejected under 35 U.S.C. § 102(a) as being anticipated by *Peercy*. Applicant respectfully traverses this rejection as provided further below.

To anticipate a claim under 35 U.S.C. § 102, a single reference must teach every element of the claim, *see* M.P.E.P. § 2131. Applicant respectfully submits that *Peercy* fails to teach each and every element of claims 1-9, 11-17, and 19-35.

A. Independent Claims 1, 11, and 19

Each of independent claims 1, 11, and 19 recite a parametric texture map. For instance, independent claim 1 recites, in part, “creating a parametric texture map ...” (emphasis added). Similarly, independent claim 11 recites, in part, “A method for creating a parametric texture map for modeling surface reflectance properties ...” (emphasis added). Likewise, independent claim 19 recites, in part, “a parametric texture map executable by said graphics processor ...” (emphasis added). *Peercy* fails to teach such a parametric texture map as recited by these independent claims, as discussed further below.

Peercy is directed to a bump map technique, rather than a parametric texture map (PTM) technique. As discussed in the specification of the present application, PTM is a different texture mapping technique than bump mapping. Accordingly, one of ordinary skill in the art would not read *Peercy*’s bump map technique as a PTM technique. In general, in a bump mapping technique, a bump map includes normal vectors that are associated with each pixel of a texture map that is applied to a geometric object. Separate hardware/software components may evaluate specular and/or diffuse components of lighting (*see e.g.*, blocks 280 and 290 of FIGURE 2A of *Peercy*) for rendering a digital image. In contrast, a parametric texture map includes function(s) at each pixel of a texture map for evaluating certain variables (or parameters) for use in rendering pixels of a digital image. For instance, in certain PTM techniques, a function includes coefficients specifying a function that operates on two spatial variables (for defining X and Y coordinates within a digital image) and two variables defining lighting direction. Such PTM function may be used in rendering the pixels of digital image. That is, the pixel at each spatial location (corresponding to a certain value for the two spatial variables, X and Y) can be rendered taking into account specified lighting direction (defined by the two lighting variables provided to the PTM function). Thus, in the PTM technique, the texture map includes a function for use in rendering a digital image that takes into account such properties as lighting, etc., rather than merely defining a surface (with normal vectors) and using separate hardware/software for

determining the pixel values accounting for lighting conditions, etc., as in the bump mapping technique.

In view of the above, the bump mapping technique of *Peercy* does not anticipate the recited parametric texture map of independent claims 1, 11, and 19. Accordingly, withdrawal of the rejection of independent claims 1, 11, and 19 is respectfully requested.

B. Independent Claims 27 and 32

Independent claim 27, as amended herein, recites “a texture map data structure including a function for representing a texture map of a plurality of texels, said function evaluating at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector” (emphasis added).

Independent claim 32, as amended herein, recites “a texture map data structure including a function for representing a texture map of a plurality of texels, said function evaluating at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector” (emphasis added).

Thus, independent claims 27 and 32 do not specifically recite a parametric texture map, as with independent claims 1, 11, and 19 discussed above. However, independent claims 27 and 32 each specifically recite a texture map data structure that includes a function. In claim 27 the function evaluates at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector. In claim 32 the function evaluates at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector. *Peercy* fails to teach at least these elements of claims 27 and 32. That is, while *Peercy* teaches a texture map (i.e., a bump map), such texture map of *Peercy* does not include a function that evaluates the variables as specified by claim 27 or the variables as specified by claim 32. Again, as discussed above, in bump mapping, the texture map includes normal vectors that are associated with each pixel of a texture map that is applied to a geometric object. Separate hardware/software components may evaluate specular and/or diffuse components of lighting (see e.g., blocks 280 and 290 of FIGURE 2A of *Peercy*) for rendering a digital image, but a

function for evaluating such variables as those of claims 27 and 32 is not included in the bump map.

In view of the above, the bump mapping technique of *Peercy* does not anticipate independent claims 27 and 32. Accordingly, withdrawal of the rejection of independent claims 27 and 32 is respectfully requested.

C. Dependent Claims 2-9, 12-17, 20-26, 28-31, and 33-35

Dependent claims 2-9, 12-17, 20-26, 28-31, and 33-35 stand rejected under 35 U.S.C. § 102(a) as being anticipated by *Peercy*. In view of the above, Applicant respectfully submits that independent claims 1, 11, 19, 27, and 32 are not anticipated by *Peercy* because *Peercy* fails to teach every element of those independent claims. Further, each of dependent claims 2-9, 12-17, 20-26, 28-31, and 33-35 depend either directly or indirectly from one of independent claims 1, 11, 19, 27, and 32, and thus inherit all limitations of the respective independent claim from which they depend. It is respectfully submitted that dependent claims 2-9, 12-17, 20-26, 28-31, and 33-35 are allowable not only because of their dependency from their respective independent claims for the reasons discussed above, but also in view of their novel claim features (which both narrow the scope of the particular claims and compel a broader interpretation of the respective base claim from which they depend).

IV. Rejections Under 35 U.S.C. § 103(a)

Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Peercy* in view of *Cabral*, and claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Peercy* in view of *Toh*. Dependent claim 10 depends from independent claim 1 (and thus inherits all limitations of claim 1), and dependent claim 18 depends from independent claim 11 (and thus inherits all limitations of claim 11). In view of the above, Applicant respectfully submits that independent claims 1 and 11 are of patentable merit. It is respectfully submitted that dependent claims 10 and 18 are allowable at least because of their dependency from independent claims 1 and 11, respectively, for the reasons discussed above.

V. New Claims 36-51

New claims 36-51 are presented herein. Claims 36, 39, 42, 45, and 49 are independent claims. Claims 37-38 depend from claim 36, claims 40-41 depend from claim 39, claims 43-44 depend from claim 42, claims 46-48 depend from claim 45, and claims 50-51 depend from claim 49. Claims 36-51 are believed to be of patentable merit over the applied references of record.

For instance, independent claim 36 recites “using a texture map that includes a function for use in rendering a digital image having surface reflectance properties, wherein said function evaluates more than two variables directed to surface reflectance properties” (emphasis added). As discussed above, the bump map of *Peercy* does not include such a function therein.

Independent claim 39 recites “a texture map that includes a function for use in rendering a digital image, wherein said function evaluates more than two variables relating to surface reflectance properties of said digital image” (emphasis added). Again, the bump map of *Peercy* does not include such a function therein.

Independent claim 42 recites “receiving more than two independent variables relating to surface reflectance properties of a digital image to be rendered; and using a function of a texture map for processing the received variables to render the digital image having surface reflectance properties in accordance with the received variables” (emphasis added). Again, the bump map of *Peercy* does not include a function as recited by this claim.

Independent claim 45 recites “a texture map that includes a Bidirectional Reflectance Distribution Function (BRDF) for use in rendering a digital image, wherein said BRDF includes more than two variables relating to surface reflectance properties of said digital image” (emphasis added). Again, the bump map of *Peercy* does not include such a BRDF therein.

Independent claim 49 recites “code for using a function included in a texture map for rendering a digital image, wherein said function evaluates the received at least four independent surface reflectance property variables to render said digital image having proper

surface reflectance properties” (emphasis added). Again, the bump map of *Peercy* does not include such a function therein.

VI. Conclusion

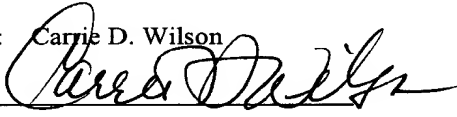
In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Date of Deposit: June 3, 2004

Typed Name: Carrie D. Wilson

Signature: 

Respectfully submitted,

By: 

Jody C. Bishop

Attorney/Agent for Applicant(s)

Reg. No. 44,034

Date: June 3, 2004

Telephone No. (214) 855-8007